

Comparison of competences between Problem-Based Learning (PBL) and Non-Problem-Based graduate nurses in a Provincial Hospital in South Africa

Useh U, Mosebudi D, Tsolo G, Kgwakgwa D.K

Department of Nursing Sciences
School of Environmental and Health, North-West University, Mafikeng Campus, South Africa
Email: ushotane.useh@nwu.ac.za

Abstract: The study sought to compare the competences between PBL and Non-problem based graduate nurses in a Provincial Hospital in South Africa. This was a comparative descriptive and cross-sectional design. Data was collected with self constructed questionnaires which were handed out during duty hours to graduate nurses who were present at the time of data collection. The findings revealed the top 5 most ranked competences by both groups as critical thinking, problem solving, long-life learning, collaboration with other medical team and holistic approach to health care. 13 nurses out of 20 participants of PBL group ranked critical thinking in the 1st position compared to the Non-PBL graduates who ranked it at 11th. Problem solving was ranked at 2nd position by 45.0% of PBL group while about 21.4% the Non-PBL ranked it at 5th position. The PBL group (25.0%) ranked long-life learning as at the 3rd position as compared to Non-PBL group (28.6%) who ranked it at 13th position. Graduates of the PBL approach ranked critical thinking, problem solving, and lifelong learning highly as compared to the Non-PBL graduates. PBL graduates also indicated that they continue with updating their professional knowledge through the use of information technology.

[Useh U, Mosebudi D, Tsolo G, Kgwakgwa D.K. **Comparison of competences between Problem-Based Learning (PBL) and Non-Problem-Based graduate nurses in a Provincial Hospital in South Africa.** *Life Sci J* 2012;9(3):2512-2517] (ISSN:1097-8135). <http://www.lifesciencesite.com>. 364

Key words: Problem Based Learning, Problem solving, critical thinking, collaboration

1. Introduction

The nursing profession has advanced dramatically over the past 50 years. In this modern age people are living longer; technology is advancing at a rapid rate, and patients are presenting with more critical ailment. An estimated 35 million nurses and midwives make up the greater part of the global health-care workforce. Nurses and midwives make a substantial contribution to health-delivery systems in primary care, acute care and community care settings (WHO, 2006). While nursing and midwifery are unique health-care professions, the desire to build the workforce capacity with competent practitioners is a common goal that is reflected in the WHO strategic directions for nursing and midwifery (WHO, 2006).

As more and more developments take place in the nursing profession, the need to identify competency and its role in maintaining optimal health care practices is increasingly demanded and appreciated. Not only is the government and the hospital management responsible for maintaining competency, but also the nursing staff at team level as well as at professional level are responsible to maintain the standards (Smith, 2006). It has been reported that budgetary constraints and a shrinking nursing workforce have added an additional strain on the ability of nurses to remain clinically competent in this fast-paced healthcare environment (Distler, 2006).

These changes have compelled nursing schools worldwide to revise their approach to nursing education to keep up with the challenges faced in nursing practice. This led to the emergence of such terms as problem-based learning, critical thinking, an evidence-based practice, and student-centered teaching strategies have replaced traditional terminology typically linked with nursing education and practice (Woodward & Ferrier, 1983).

Gabr and Mohamed (2011), describes problem based learning (PBL), as a student-centered instructional approach in which students collaboratively solve problems and reflect on their experiences. The PBL approach encourages students to be active and independent, to take more responsibility for their learning (Staun et al, 2009). Students graduating from problem-based medical schools are, for instance, expected to be more skilled in interpersonal communication, are thought to be better problem-solvers and to be better prepared for self-directed, lifelong learning.

These expectations are based on the particular characteristics of PBL: students collaborate in small groups, their learning is centered on problems relevant to their domain of study, and they spend much time on self-directed learning (Yuan, 2009). PBL aims to developing scientific understanding through real-world cases, developing reasoning

strategies, and developing self-directed learning strategies (Lee, Karen and Frank, 2010).

Traditional approach is the method of teaching normally referred to as the lecture method, where a teacher or lecturer would be the disseminator of information and a student becomes a passive absorber of facts (Major and palmer, 2001). Major and Palmer (2001) argues that, this type of instruction has often allowed students to be passive learners in the classroom. They also revealed that in PBL classes students work in teams to solve one or more complex and compelling "real world" problems such as clinical situation. A deduction can therefore be made that the difference between PBL and traditional teaching is chiefly in the method of imparting knowledge. Therefore a PBL approach is learner centered whereas the traditional lecturing method it is teacher centered.

According to Wood (2003), in problem based learning (PBL) students do independent, self directed study before returning to the group or class to discuss and refine their acquired knowledge. Wood (2003) further elaborates that PBL is not all about solving problems but it directs students to use appropriate examples of problems to enrich their knowledge and understanding.

Smith (2009) also describes Problem-based learning (PBL) as learning based on solving problems that occur in the real world of practice. Instead of assigning research papers, reading assignments, or traditional lecturing and teaching methods, students are given problems to solve. This type of learning is highly sophisticated. It makes a shift from a focus on teaching to a focus on learning. The process is aimed at using the power of authentic problem solving to engage students and enhance their learning and motivation. Problem based learning aims to developing scientific understanding through real-world cases, developing reasoning strategies, and developing self-directed learning strategies (Ali, 2010).

According to Wood (2003), generic skills and attitude that the students acquire through PBL are; chairing a group, listening, recording, cooperation, respect for colleagues' views, critical thinking and evaluation of literature, self directed learning and presentation skills.

Those who support problem-based learning (PBL) as an approach to learning and instruction articulate high expectations of the professional competencies of the graduates produced by such programmes, (Gabr et al, 2011). Competency in nursing literature has being characterized by a variety of interpretations (Harrison et al, 2010). Competency has come to refer to a specified attributes that may be possessed by someone, perhaps within a series of

related competence, connoting both a concrete category on which a person's adequacy or sufficiency may be judged and that quality or state of being which characterizes a person as being competent, able, adequate or sufficient within a category (Short, 1984). Short (1984) defines competency as a cluster of related knowledge, skills, and attitudes that affect a major part of one's job (a role or responsibility), that correlates with performance on the job, that can be measured against well accepted standards, and can be improved via training and development.

Competency is comprised of integrated skills and individual attributes and one can conclude that the concept competency is based on education or training. Woodruffe (1993) defined competence as aspects of the job that an individual can perform, and competency as individual's behavior underpinning competence performance. He also suggested that a job includes set of deliverables, output or roles, each of which require some competencies but competencies are not aspects of the job. Xu, Xu and Zhang (2001) regards nursing competencies as a set of knowledge, skills, traits, motives and attitudes that are required for effective performance in a wide range of nursing jobs and various clinical setting. The above idea is supported by Applin et al, 2011 who describes graduate competence as a measure of quality assurance that indicates that professional nurses are prepared to engage in safe, ethical and legal nursing practice in rapidly changing environments.

Gabr et al (2011) describes the nursing environment as a constantly changing environment where self directed learning is essential for enabling nursing students to develop independent learning skills, a sense of accountability, responsibility and assertiveness as they are the essential attributes throughout the nursing career. Gabr et al continues to argue that a deep approach to learning is associated with the development of desirable lifelong, self-directed learning traits beyond tertiary education. This would mean that since health professionals have to keep abreast with rapidly changing technologies and the fast expansion of specialized knowledge, the possession of self direction in learning is essential so that they can seek out the required knowledge when the need arises.

Not all schools of nursing education have embraced the need to change to new methods of teaching and continue to teach as they were taught. The nursing educational institutions in the North West Province of South Africa continue to use both problem based learning and non problem based learning strategies to equip their student nurses with nursing competences required for the professional role.

Graduate competence is a measure of quality assurance that indicates that professional nurses are prepared to engage in safe, ethical and legal nursing practice in rapidly changing environments (Applin, 2011). Despite advances made in the provision of improved nursing education to graduate nurses in order to be in par with the constantly changing lifestyle, it is still not known which curriculum between Problem Based- and non-Problem Based learning could best equip graduate nurses with required competencies to take up professional role (Iwasiw et al, 2005).

A dearth of information in the North West training of nurses was observed. This study therefore sought to compare the competences between PBL and Non-problem based graduate nurses in a Provincial Hospital in North West Province of South Africa.

2. Research Methodology

The study design was comparative descriptive and cross-sectional. It was comparative descriptive because the research study compared and described the competences between problem-based learning and non-problem based graduate nurses.

The study was conducted in a hospital in Mafikeng. Mafikeng is Provincial capital of North West Province of South Africa. The study setting was chosen on the basis of the population of nurses that used problem based learning and non-problem based learning as different learning approaches.

The population of this study was all nurses in the chosen hospital. The research study involved 50 graduate nurses working at the chosen hospital who were conveniently chosen. 20 of the participants were trained with the PBL approach, while 28 used the non-PBL approach (traditional lecture method); the remaining 2 participants had used both learning approaches.

Instrument for Data collection

A self-constructed questionnaire was used to collect data in this study. The questionnaire consisted of three parts. The first part consisted of demographical information, the second part of nursing competences and the third part professional development. The questionnaire was prepared and distributed to nurses in the different wards.

Content validity of the instrument was done by utilizing literature and contents from other tools in similar studies. While inter-rater reliability was ensured through a random selection of 6 respondents to check responses using three different interviewers who interviewed the same respondents at different times using the same instrument. Responses were compared across participants in the pilot study. These were however found to be similar.

Procedure for Data Collection

Permission to conduct this study was sought from hospital management. After this, the project was then introduced to the participants and their individual consent was sought to participate in this study. The questionnaires were handed out during duty hours to nurses who were present at the time of data collection.

Data management and Analysis

Statistical Package for Social Sciences (SPSS) version 20 was used to analyze data. Demographic information were analyzed with descriptive statistics of percentages, mean and graphs. Chi-square statistic was used to answer the set hypothesis, with the level of significance set at 0.05.

Ethical consideration

Permission was obtained in advance from the Ethical Review Board of the Department of Nursing in North West University-Mafikeng campus and from North West Provincial Department of health and Mafikeng Provincial hospital where the research was conducted. The aim of the study was explained as well as the comprehensive and clear information regarding participation in the study was given to nurses. Participation was entirely voluntary with the right of withdrawal from the study without giving reasons at any time of the study. A written informed consent from the participants was obtained voluntarily. In maintaining the privacy and confidentiality the participant's personal data was not included in the questionnaire.

3. Results

Fifty nurses participated in this study, 20 were trained with the PBL approach, 28 used the Non-PBL or traditional lecture method, 2 participants used both approaches.

Age and gender

The mean age of participants was 34 years for both PBL and non-PBL graduate nurses with the age ranges of 23 to 55 years. The mode age was 28 years, with 7 of them as 28 years old. Gender distribution was as follows: For the PBL group, 85% were females and 15% were males. While in the Non-PBL approach 39 % were females and the remaining 61% were males.

Qualifications

56% had college diploma while the remaining 44% had university degree.

Competences ranked by the PBL and Non-PBL groups

The top 5 most ranked competences by both groups were critical thinking, problem solving, long-life learning, collaboration with other medical team and holistic approach to health care. 13 graduate

nurses out of 20 participants of PBL ranked critical thinking as the 1st. Detail of ranking is presented in Table 1

Table 1: Comparison of competences of PBL and NON-PBL graduate nurses

Competences	Group	Rank	N (%)	p-value
Critical thinking	PBL	1 st	13 (65)	.649
	N-PBL	11 th , 12 th	5 (18)	
Problem solving	PBL	2 nd	9 (45)	.270
	N-PBL	5 th	6 (21)	
Long-life learning	PBL	3 rd	5 (25)	.014
	N-PBL	13	8 (28.6)	
Collaboration with other medical team	PBL	7	4 (20)	.313
	N-PBL	4	8 (28.6)	
Responsibility	PBL	4	4 (20)	.465
	Non-PBL	4	5 (17.9)	
Communication	PBL	9 th , 12 th	3 (15)	.870
	N-PBL	9 th	5 (17.9)	
Respect for colleagues	PBL	10 th	5 (25)	.001
	N-PBL	6 th	5 (17.9)	
Sharing information	PBL	8 th & 9 th	5 (25)	.000
	N-PBL	13 th	6 (21)	
Leadership abilities	PBL	10 th	5 (25)	.663
	N-PBL	11 th	5 (18)	
Management decision making	PBL	5 th	4 (20)	.055
	N-PBL	6 th	5 (18)	
Teamwork	PBL	4 th & 12 th	4 (20)	.696
	N-PBL	5 th	6 (21)	
Holistic approach	PBL	13 th	4 (20)	.159
	N-PBL	1 st	8 (28.6)	
Professional accountability	PBL	13 th	5 (25)	.300
	N-PBL	2 th	6 (21)	

Continuation with Lifelong learning

Most (65.0%) of the PBL graduate nurses stated they would continue with lifelong.

The development of competences

Compared with the Non-PBL graduates, most PBL graduate nurses (13 participants out of 20), (65.0%) indicated that their competences were developed during training. The remaining 35.0% developed their competencies after training. The Non-PBL graduates (6 participants out of 28); about 21.4% indicated that their competences were developed during training while the remaining 53.6% developed them after training.

Professional Development

Most (90.0%) of the PBL trained nurses stated that they would continue with professional development, compared with 71.4% of Non-PBL, group. The percentage of graduate nurses who admitted to maintaining and updating professional

knowledge was 90% and 46% for PBL and PBL groups respectively.

Information technology usage and learning approach

About 75.0% PBL graduates indicated that they used information technology for accessing new knowledge. While 68% of the Non-PBL nurses indicated that they do not use information technology to access new information.

Acknowledgement of limitations and learning approach

About 60% of both PBL trained nurses and Non-PBL graduates indicated that there are no limitations in their own competences. There was no significant association between mode of learning and acknowledging limitation in own competencies (p=0.537)

Association between researching and learning approach

About 80 % of PBL and 61.% of Non-PBL would take part and contribute to research to develop their own knowledge and the knowledge of the others. There was however no significant association between the mode of study and taking part and contribution to research (p=0.398)

Competences

The association between competences and learning approach is presented in table 3.

Table 3: Association between learning approach and competences

Competencies	P-value	Significant or not Significant
Critical thinking	.649	Not significant
Problem solving ability	.270	Not significant
Lifelong learning	.014	Significant
Collaboration with other medical teams	.313	Not significant
Responsibility	.465	Not significant
Communication skills	.870	Not significant
Respect for colleagues' views	.001	Significant
Sharing information	.000	Significant
Leadership abilities	.665	Not significant
Management decision making abilities	.055	Marginal
Teamwork	.696	Not significant
Holistic approach or health care delivery	.159	Not significant
Professional accountability	.300	Not significant

4. Discussions

This study compared competences between nurses who used the PBL and non-PBL approaches in training.

The main themes that emerged from the PBL rankings were: critical thinking, problem-solving skills, lifelong learning, responsibility, and teamwork and management decision making. In this study critical thinking was ranked at the 1st position by 13 PBL participants out of 20 which are 65.0% as compared to 4 Non-PBL participants out of 28 who ranked it as 1st which is 14.3% position. The majority of Non-PBL ranked critical thinking as the 11th and 12th position. The 1st position indicates the competency that the participants possess most while 11th and 12th indicates the least they possess. It was revealed that most PBL participants possess critical thinking skills as compared to the Non-PBL graduates. Despite high percentages and rankings there was no significant difference between the two groups. This finding was at variance with those of Ozturk et al (2008) which compared the critical thinking disposition between PBL and Non-PBL nursing students and revealed a significant difference between the learning approaches. High critical thinking disposition scores were reported in the PBL group than the Non-PBL group. The reason for the differences might be linked to the differences in sample sizes and methodologies. The outcome of this study also agrees with those of Applin et al (2011) who reported that majority of PBL graduates nurses acquired critical thinking skills during.

Our study found no statistical significant differences between those of PBL and Non-PBL: groups in problem solving skills, collaboration with other medical team, responsibility, leadership abilities, teamwork, holistic approach and professional accountability. There was however differences in rankings in problem solving skills, responsibility, teamwork between the two groups (higher in the PBL than in Non-PBL trained nurses).

Collaboration with other medical team, communication, leadership abilities, holistic approach and professional accountability were ranked high by the Non-PBL graduates as compared to the PBL group. From these results it would appear that PBL enhances certain competences that are not found in the Non-PBL groups. Gabr et al (2011) found significance differences between students' problem-solving skills and ability to work in a team in PBL than in the Non-PBL group. This was corroborated by Koh et al, (2008).

Development of competences

Most PBL graduates indicated that competencies are mainly acquired during training,

while the majority of the Non-PBL graduates indicated that the competencies were developed after training while working.

There was also a significant difference between the learning approach and the development of competences.

The findings of this study are in agreement with the findings of the study conducted by Prince et al (2005) who found that PBL group acquired some competences at the medical school than the Non-PBL group. It is expected that Non PBL group will begin to acquire these competences during training as compared with PBL. This is because the training of PBL group mimics real life situation and attempting to solve real life problem during training.

In conclusion, PBL enhances nursing competences than the Non-PBL learning approach.. Graduates of the PBL approach ranked critical thinking, problem solving, and lifelong learning high as compared to the Non-PBL graduates. They also indicated that they continue with updating their professional knowledge through the use of information technology.

Corresponding Author:

Prof Useh U
School of Environmental and Health,
North-West University, Mafikeng Campus
Email: ushotanefe.useh@nwu.ac.za

References

- 1 Applin H, Williams B, Day R, Buro K. A comparison of competencies between problem-based learning and non-problem-based graduate nurses 2011; Nurse Educ Today ; 39(2):129-34
2. Distler JW. Critical thinking and clinical competence: Results. Nurse Education in Practice , 2007 ;7, 53–59.
3. Gabr H, Mohamed N. Effect of problem-based learning on undergraduate nursing students enrolled in nursing administration course. International Journal of Academic Research 2011;3(1):154-162
4. Iwasiw C, Glodenberg D, Andrusyszyn, M. Curriculum Development in Nursing Education. Jones and Bartlett, 2005
5. Koh GC, Khoo HE, Wong ML, Koh D. The effect of problem based learning during medical school on physician competency: a systematic review. Canadian Medical Journal. 2008; 178:(1):34-41.

6. Lee Y, Mann KV, Frank BW. What drives students' self-directed learning in a hybrid PBL curriculum. *Adv in Health Sci Educ* 2010; 15:425-437.
7. Major CH, Palmer B. Assessing the Effectiveness of problem-based learning in Higher Education: Lessons from Literature. *Academic Exchange Quarterly*. 2001; 5(1). Available on :<http://www.rapidintellect.com/AEQweb/mop4s/pr01.htm>
8. Ozturk C, Muslu G, Dicle A. a comparison of problem-based and traditional education on nursing students' critical thinking disposition 2008; *Nurse Education Today*; 2008: 28: 627-632.
9. Short EC. Competence Reexamined. *Educational Theory*1984;34(3):201.
10. Smith R. Problem-based Learning. *Nursing Online Module* . 2009, October.
11. Staun M, Bergstrom B, Wadensten B. Evaluation of a PBL strategy in clinical supervision of nursing students: patient-centred training in student dedicated treatment room. *Nurse Education Today* 2010; 30: 631-637.
12. Wood D F. Problem based learning. *ABC of learning and teaching in medicine* . 2005. Available on <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1125189/pdf/328.pdf?tool=pmcentrez>
- Woodward CA, Ferrier BM. The content of medical curriculum at McMaster University: graduates evaluation of their preparation and postgraduates training 1983; *Medical Education*; 17:54-60.
13. Woodruffe C. *Assessment Centres: Identifying and Developing Competence* 1993, London: IPM
14. WHO, *Working together for Health*, Geneva: WHO, 2006
15. Xu Y, Xu Z, Zhang J. The nursing education system in the People's Republic of China: evolution, structure and reform. *International Nursing Review*; 47(4):207-217.
16. Yuan F, Chiu C. A hierarchical design of case-based reasoning in the balanced scorecard application. *Expert Systems with Applications*. 2009: 333-342

9/10/2012